Volume 36 | Issue 1 Article 13

1974

Navicular Disesase

James L. Baum
Iowa State University

NAVICULAR DISEASE

by
James L. Baum*

Definition

Navicular disease is an osteoarthritis of the navicular bone which may begin as bursitis of the navicular bursa. This bursa lies between the deep flexor tendon and the navicular bone. The bursitis eventually leads to degenerative and erosive lesions of the fibrocartilage on the deep flexor tendon surface of the navicular bone. The syndrome is characterized early by intermittent lameness and a stumbling gait.

Etiology

The exact cause is not agreed upon, but there are several predisposing conditions. Horses with poor conformation have a higher incidence of this lameness. Upright pasterns and shoulders result in increased forces on the navicular bone and deep flexor tendon which may lead to a navicular bursitis. Outward rotation of the canon bone may produce uneven stress on the navicular bone. Long sloping pasterns cause an increased pressure on the deep flexor tendon. Feet small in proportion to body size, long toes and hard high hooves produce increased pressure per unit area of the foot. Concussion produced by hard work, especially on a hard surface, may predispose to navicular disease. This is more commonly seen in horses that are raced, used for cutting, calf roping, barrel racing and in horses with exaggerated gaits as seen with Tennessee Walkers and gaited horses. Deep puncture wounds which penetrate the navicular bursa can also lead to navicular disease.

Clinical Signs

The signs are often not readily noticeable early in the disease. Intermittent lameness, especially lameness which regresses with rest or decreased work, is noticed early. As the disease progresses, the lameness increases in frequency and severity. The anterior phase of the stride is shortened which may lead the owner to think that the horse is shoulder lame. Occasionally a secondary bicepital bursitis will develop. When the animal affected with navicular disease travels, he attempts to land on the toe in an effort to relieve the pressure on the deep flexor tendon and navicular bone. Consequently, the animal has a tendency to stumble. The toe becomes excessively worn and sometimes sole bruises occur in the toe area. As the disease progresses, the heels will contract and the frog will atrophy due to decreased frog pressure. The entire hoof decreases in size and the sole will become more concave. An increased sensitivity over the middle one-third of the frog and in the area of the bars is noted with hoof testers. The results should be compared with the other foot, if sound, or with the hind feet because some horses object to the use of hoof testers. If the sole is bruised over the toe, it will be sensitive to the hoof testers. The lameness and sensitivity to the hoof tester is alleviated or decreased with a posterior digital nerve block.

Rupture of the deep flexor tendon occurs when adhesions between the tendon and navicular bone break down producing a weakened, torn, necrotic area, then ensuing rupture.

Post-mortem examination reveals changes similar to the radiographic changes. Discoloration of the navicular bone and deep flexor tendon, erosions of the cartilage and fibrotic adhesions between the deep flexor tendon and the navicular bone may also be seen.

* Mr. Baum is a fourth year student in the College of Veterinary Medicine, Iowa State University.

Diagnosis

History and clinical observations are important means of diagnosis. Horses of all ages can be affected, but it is more commonly seen in older horses. Usually both front feet are involved, but generally the horse is more lame in one foot. Stumbling, intermittent lameness and results of the hoof tester are indicative of navicular disase. The use of a bilateral posterior digital nerve block may aid in the diagnosis. This nerve runs between the posterior edge of the first phalanx and the anterior edge of the superficial flexor tendon parallel to the edge of the deep flexor tendon. 5cc of 2% lidocaine[a] are injected on both the medial and lateral sides, one-third of the way down from the fetlock joint to the coronary band using a 20-25 gauge, one-half to one inch needle. Fifteen to twenty minutes should be allowed for the anesthetic to take full effect. The animal may have to be worked for a few minutes before it will be moving apparently sound. Anesthesis of the navicular bursa can also be used as a diagnostic procedure. The hair should be clipped around the fossa in the pastern region and then the area painted with antiseptic. Then inject a small amount of 2% lidocaine to anesthetize the skin. After this is effective, use an 18-gauge, 2-inch needle and enter the fossa line parallel to the coronary band. Up to 5cc of 2% lidocaine is injected into the bursa. When tension is encountered, enough anesthetic has been injected. This will also block pain from a fractured navicular bone. Unfortunately, in most instances both the posterior and anterior branches are anesthetized and consequently the procedure is not diagnostic. Also, pain from any other lesion in the posterior portion of the foot will be abolished.

Radiographs will not exhibit changes in all cases. The changes seen are increased size and abnormally shaped vascular channels, roughened ventral edge and decreased density of the navicular bone, pointed or spurred ends and decreased articular space. Anterior-posterior and lateral views should be taken with the foot on a wooden block. The cassette is placed at an angle of about 30 degrees to the ground under the posterior half of the foot in contact with the heels of the hoof. The anterior half of the foot is on the block. The head of the machine is held at a 55 degree angle to the ground and centered on the coronary band. It is imperative that the foot is clean. The lateral view is taken with the beam centered on the navicular bone.

A differential diagnosis would include puncture wounds of the sole and/or frog, fractured navicular bone, laminitis, sole bruises and corns. These conditions may be differentiated by taking radiographs, trimming the foot, using hoof testers and observing the horse move.

Treatments

Navicular disease is incurable, but several methods of therapy will help prolong the useful life of the horse. Corrective shoeing would involve increasing the hoof angle and shortening the toe. The toe of the shoe should be rolled, and branches from the area of the quarter to the heels should be slippered. A slippered shoe will aid in expansion of the hoof. Parallel grooves in the posterior side of the hoof will also aid in expansion. A bar shoe also helps. Rim pads or full pads will decrease concussion to the hoof. When the horse it not being worked, it is best to remove the shoe and trim the feet. Corrective shoeing will often bring the animal relief until the disease progresses too far.

Administration of phenlybutazone may bring temporary relief. As the disease progresses, the effectiveness of this drug diminishes.

Posterior digital neurectomy involves removal of approximately ¾ inch of the posterior digital nerve. This procedure will only decrease the pain and is not always successful. The lack of success is due to other areas of pathology or branches of the nerve which may be missed. Complications to this neurectomy are not uncommon. Neuromas often form that may produce pain.

Blocking the nerve with a German local anesthetic, Serapin, may be tried. This

[a] Xylocaine—manufactured by Astra Pharmaceutical Products, Inc., Worchester, Massachusetts.

block lasts up to 4-6 weeks, but it is not always successful. Serapin is irritating so anesthesia with lidocaine should be done first.

Injection of the navicular bursa is more successful in young horses but the results are varied. The relief obtained may last up to eight weeks. The technique is the same as injection with a local anesthetic except that excess fluid is withdrawn. 40-80-mg of methylprednisolone[b] is injected into the bursa.

Prognosis

The prognosis is always unfavorable. Thoroughbreds seem to respond best to treatment. American saddlebreds, hunters and jumpers, and Tennessee Walkers respond better than quarter horses. The latter breeds more commonly have other lesions involved and the navicular disease is not detected as early as in racing thoroughbreds. The response to treatment will rarely exceed two years.

[b] Depo-Medrol—manufactured by Upjohn Company, Kalamazoo, Michigan.

Prevention

To avoid navicular problems, horses with undesirable conformation should be avoided. An effort should be made to compensate for hard concussion by the use of cushion shoes or pads. Young horses should not be trained too hard, especially if they have poor conformation or are worked on hard surfaces. It is also important to keep animals that are in training properly trimmed and shod.

Bibliography

1. Adams, O. R., *Lameness in Horses*, Lea and Febriger Publishers, 2nd edition, 1966.
2. Carlson, W. D., *Veterinary Radiology*, Lea and Febriger Publishers, 2nd edition, 1967.
3. Johnson T. H., Conditions of the Forelimb, *Equine Medicine and Surgery*, E. T. Catcott and T. F. Smithcors, editors, American Veterinary Publications, Inc., 2nd edition, 1972, pp. 538–540.
4. Lundvall, R. I. Personal Communication, 1973.
5. Rooney, J. R., Navicular Disease, Proceedings of the 13th Annual Convention of the A.A.E.P., 1967, p. 263.
6. Rooney, J. R., *Biomechanics of Lameness in Horses*, The William and Wilkin Co., Publihters, 1969, pp. 181–187.
7. Schebity, H., Podotrochlosis in the Horse, Proceedings of the 10th Annual Convention of the A.A.E.P., 1964, p. 49.
8. Wilkinson, G. T., Pathology of Navicular Disease, British Veterinary Journal, 1953, Vol. 109, p. 53.

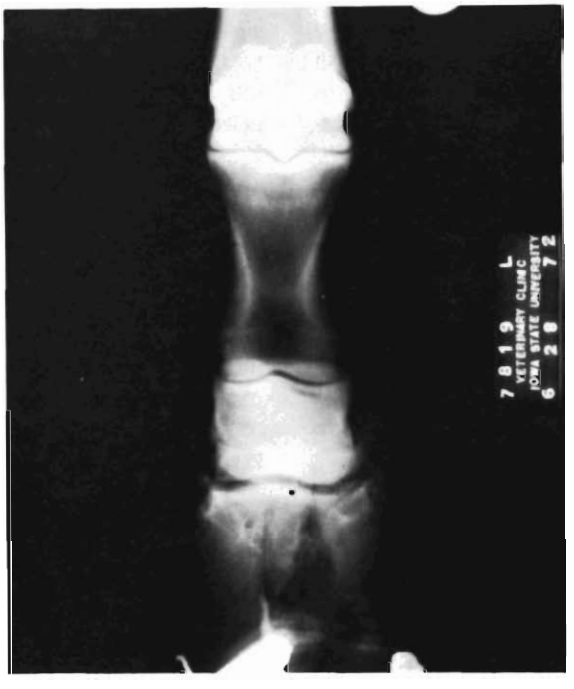

Fig. 1
Erosions and build up of bone on the ends of the navicular bone.

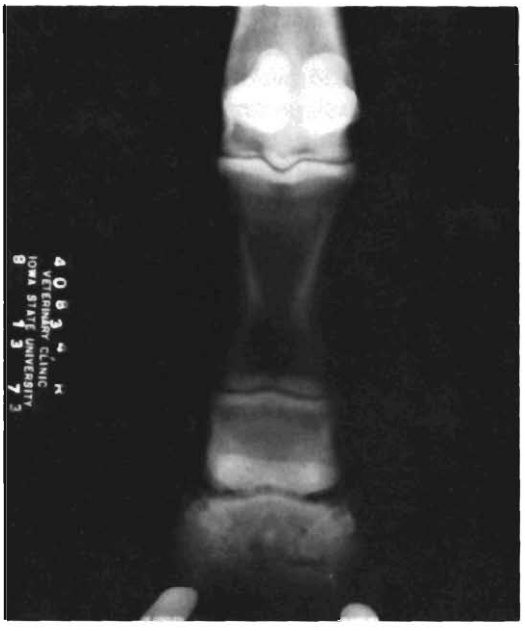

Fig. 2
Enlarged vascular channels in the navicular bone.

Fig. 3
Recent fracture of the navicular bone.

Examination of the Thoraco Lumbar Cord

by Robert W. Carithers, D.V.M., Ph.D.*

Spinal disorders are often confusing when first presented to the clinician. Unfortunately, too much reliance is placed upon radiographic examination. A thorough neurological examination should not be neglected. Such an examination can be rapidly performed, and is inexpensive. Proper radiological interpretation depends

* Dr. Carithers is an Assistant Professor in Veterinary Clinical Sciences, Iowa State University.